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AUTHOR Terrell, Dudley J.; And Others
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ABSTRACT

The Full Scale Intelligence Quotient on tests such as the Wechsler Intelligence Scale for Children-Revised (WISC-R) provides a single score which describes a person's over-all performance in relation to other people of similar age. However, two people with identical Full Scale scores may have quite different profiles of strengths and weaknesses. It is often important to go beyond the Full Scale score and determine relative strengths and weaknesses based on subtest performance. Since there is a growing interest in computer software tailored to the needs of clinical psychologists, a computer program was developed which analyzed WISC-R subtest scatter using a standard method of comparing subtest scores with the Verbal and Performance means. To demonstrate the efficiency of such a program for professional users of the WISC-R, graduate students in psychology, school psychometrists, and clinical psychologists (N=15) received automated interpretations of some of their own clients' WISC-R scores based on these analyses. The interpretations were evaluated and rated by the clinicians for validity on a 5-point Likert-type scale. The results indicated that the clinicians agreed with the computer analyses, thus supporting the efficiency of a computer program in this area. (Author/WAS)

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Automated Analysis of WISC-R Subtest Scatter

Dudley J. Terrell, Jeffrey T. Smith,

Robert F. Tacon, Jr., & Thomas S. Bennett

University of South Alabama

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Running head: Automated Analysis

Abstract

A computer program was developed to analyze WISC-R subtest scatter utilizing a standard method of comparing subtest scores with the Verbal and Performance means. Graduate students in psychology, school psychometrists, and clinical psychologists were given automated interpretations of some of their own clients' WISC-R scores based on these analyses. The interpretations were evaluated and rated by the clinicians for validity on a 5-point Likert-type scale. The results indicated that the subjects agreed with the computer analyses, thus supporting the efficiency of a computer program in this area.

Automated Analysis of WISC-R Subtest Scatter

A single score derived from performance on several intellectual tasks serves a limited purpose. The Full-Scale Intelligence Quotient on tests such as the WISC-R (Wechsler, 1974) does describe a person's "over-all" performance in relation to other people of similar age, but two people with identical Full-Scale scores may have quite different profiles of individual strengths and weaknesses.

Many styles of score analysis, such as comparing Verbal and Performance scores, have been used. Clinicians may also subjectively examine clusters of high or low subtest scores and determine the abilities that are common to those subtests. Kaufman (1979) describes a systematic method of comparing subtest scores with the means of the Verbal and Performance scores, and identifies various abilities that are common to more than one subtest. He considers any score differing from the mean by 3 points to be significant. Silverstein (1982) gives tables of differences between each subtest score and the Verbal, Performance, and overall averages that are required for significance at the .05 and .01 levels.

A unique feature of the Kaufman (1979) and Silverstein (1982) methods is that the patterns of test performance are interpreted in addition to the overall level. That is, each individual's scores are compared with each other as well as with those of others of the same age. A person with a low Full-Scale

score may have a wide range of strengths that are important to know for educational or vocational placement. Similarly, a person with a high Full-Scale score may exhibit some weaknesses that can deter success in certain areas. It is important when using intelligence test scores to go beyond the Full-Scale score and determine a person's relative strengths and weaknesses based on subtest performance.

As computer systems are becoming more popular in treatment and learning institutions, there is a growing interest in computer software tailored to the needs of the clinical psychologist. In the present study a computer program was developed to incorporate some of Kaufman's (1979) method of WISC-R subtest score analysis. Rather than use a fixed difference necessary for interpretive value, the computer uses the individual's Verbal and Performance standard deviations. Any score differing from the mean by one standard deviation or more is considered to be of interpretive value as quantitatively different from the other scores. Other subtests measuring similar abilities are then examined. If all of the necessary subtests differ from their respective means in the same direction as the significant test, the computer identifies the abilities associated with those tests as either relative strengths or weaknesses and prints an interpretive statement. The purpose of the present study was to demonstrate the efficiency of this computer program as judged by a sample of professional users of

the WISC-R.

Method

Subjects

The participants in this study included eight graduate students in the Psychology Department at the University of South Alabama. All of the graduate students had completed a course in the administration and interpretation of the WISC-R and three of them were presently using the WISC-R in a clinical practicum. Five master's level school psychometrists employed by the Mobile County, Alabama, Board of Education and two Ph.D. clinical psychologists also participated in the study.

Materials

Two forms were used in the study. The first, mailed to psychometrists and psychologists, solicited scores of the WISC-R subtests of clients that had been seen recently. The other form, given to each participant, was used to collect feedback about the computer-generated WISC-R profile analysis. This form allowed the participants to indicate the percentage of descriptions reported by the computer that were felt actually applied to the child. The participants also indicated how many strengths and/or weaknesses they felt were missing from the profile as well as how many did not belong there.

Computer Program

The computer program was written in FORTG1 and run on an IBM-4341 computer system. The program utilizes a conversational style of interaction and gives the user instructions for each step of the analysis. After the subtest scores are entered, the program determines means and standard deviations for the verbal and performance scores. Various combinations of subtests are then "tested" to see if the scores fall in a similar direction above or below the mean. If the scores are in the same direction and at least one of the scores is one standard deviation from the mean, then the computer prints the ability associated with that combination of subtests.

The analyses were generated and typed by a Digital Decwriter II. The eight graduate students and two of the psychometrists received analyses retyped with an IBM-Selectric Typewriter.

Procedure

Each of the graduate students were given profile analyses of three clients that were tested in the University of South Alabama Psychology Teaching Clinic. One of the three clients had been tested previously by the student. The other two clients were unknown to the students. This yielded a total of 24 cases evaluated by graduate students (16 of which were evaluated on the basis of an examination of test scores alone). The students were asked to examine the subtest scores and evaluate the validity of the computer-generated profile analyses.

Each psychometrist and clinical psychologist was asked to submit the subtest scores of ten clients seen recently in their offices, yielding a total of 70 cases seen by professionals using the WISC-R. These scores were analyzed by the computer and the resulting profiles were presented to the professionals for evaluation. They were asked to examine the profile analyses and compare them with their observations of the client in question.

There was a total of 94 individual WISC-R cases rated by 15 participants.

Each WISC-R case was evaluated with four questions answered on a 1-5 point scale (where 1 indicated very little agreement with the computer analysis and 5 indicated a high degree of agreement).

Results

A mean score for each case was computed and served as an index of agreement for that particular case. All of the individual case indices were then averaged to yield a total index of agreement. This index (Mean = 4.028, SD = 0.765) indicated that the participants tended to agree with the computer analyses. Ph.D.'s tended to agree the most (Mean = 4.825, SD = 0.206) and school psychometrists the least (Mean = 3.827, SD = 0.80). Those participants receiving computer-printed analyses (Mean = 4.075, SD = 0.772) tended to agree as much as those receiving retyped analyses (Mean = 3.985, SD = 0.764). The results reported here are of a descriptive nature and inferences about differences

between groups cannot be justified.

Discussion

An examination of the subtest scatter on the WISC-R can yield much additional information about a client beyond that derived from the Full Scale, Verbal, and Performance scores. While the total scores are useful when comparing children to their own age groups, subtest score patterns reveal a child's relative strengths and weaknesses contributing to test performance. The computer program developed for this study utilizes a method of subtest scatter analysis that is well documented (Kaufman, 1979). The purpose of the study was to see if professional users of the WISC-R would find that the information generated by the computer applied to the child being tested with regard to behavioral observations and the clinicians' own examination of the subtest scores.

Graduate students, school psychometrists, and clinical psychologists rated their agreement with the computer analysis by answering four questions concerning each WISC-R case. The questions assessed the percentage of relative strengths and weaknesses presented that applied to the child and the number of abilities that were missing from the analysis, but could be contributing to WISC-R performance.

Overall, the responses supported the efficacy of the computer program in analysis of WISC-R score configurations. Most of the information generated by the computer was rated as

applying to the child in question. The fact that some participants agreed less than others with the computer analyses may be due to different educational backgrounds. Four of the psychometrists have master's degrees in education. The graduate students had all been taught the Kaufman (1979) method of WISC-R interpretation and thus tended to agree more with the computer analyses.

The use of computers in schools, mental health centers, and hospitals is becoming more and more popular. The storage and data analysis capacities of computers are virtually limitless. In psychology, there may be a tendency to feel that the automated analysis of test scores is inaccurate or unacceptable. However, the method of analysis presented by Kaufman (1979) is highly mathematical and systematic, lending itself easily to computer programming. Meehl (1956) advocated the "cookbook" approach to interpretation of personality tests, stressing that methods which yield quantitative results are an improvement over the clinician's subjective evaluation. The purpose of the computer program is not to replace the work of the clinician in deriving conclusions, making recommendations, or report writing. Rather it enhances the clinician's job by locating patterns in subtest scatter consistently and instantly, leaving more time for integration of data and report writing. It gives the clinician a list of possible relative strengths and weaknesses contributing to WISC-R performance to be considered and evaluated along with other tests and observations.

References

Kaufman, A. S. Intelligent testing with the WISC-R. New York: John Wiley & Sons, 1979.

Meehl, P. Wanted - a good cookbook. American Psychologist, 1956, 11, 263-272.

Silverstein, A. B. Pattern analysis as simultaneous statistical inference. Journal of Consulting and Clinical Psychology, 1982, 50(2), 234-240.

Wechsler, D. Manual for the Wechsler Intelligence Scale for Children-Revised. New York: The Psychological Corporation, 1974.